PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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| In Re Application of: | J. Krom, et al. |
| For: | **REACTION PRODUCT DERIVED FROM AMINE-FUNCTIONALIZED ELASTOMERS AND MALEATED POLYOLEFINS** |
| Serial No.: | 09/097,035 |
| Filed: | June 12, 1998 |
| Examiner: | D.R. Wilson |
| Art Unit: | 1713 |
| Last Office Action: | February 1, 2001 |
| Attorney Docket No.: | 9608042/FIR 20007 |



**APPELLANTS' REPLY BRIEF UNDER 37 C.F.R. §1.193(b)**

Assistant Commissioner for Patents
Washington, DC 20231

Dear Sir:

This Reply Brief is in response to the Examiner's Answer of February 1, 2001.

Remarks

Issue 1

The Examiner states that Appellants' claimed composition encompasses the Coran acrylonitrile rubbers with 80 wt% of a butadiene as the nitrile rubber because Coran teaches that the acrylonitrile rubbers include butadiene copolymers with as little

as 20 wt% of acrylonitrile. Appellants respectfully maintain this rejection is inappropriate.

The present invention requires the second polymer be substantially conjugated diene units or substantially conjugated diene and vinyl aromatic units. The Examiner has deemed this argument unpersuasive, alleging that there is nothing in the claims that excludes the presence of acrylonitrile units in the nitrile rubber taught by Coran. Appellant's claims, however, exclude a 20% nitrile containing copolymer by use of the term "substantially." A 20% or greater nitrile rubber requirement such as that of Coran would not encompass a polymer that is substantially conjugated diene units or substantially conjugated diene and vinyl aromatic units. While the term "comprising", if used alone would permit the presence of as little as 20% acrylonitrile units in the polybutadiene polymer, as alleged by the Examiner, the "substantially" language does not. Moreover, the transition term "comprising" does not permit the Examiner to disregard later terms of the claim, particularly, the term "substantially"..

More explicitly, the Examiner quotes M.P.E.P.§ 2111.03 stating that "comprising leaves the claim open for the inclusion of unspecified ingredients even on major amounts". While this is true, it ignores Appellants additional limitation that the second polymer be "substantially" a copolymer of conjugated diene units.... A substantially conjugated diene polymer is not an acrylonitrile rubber of at least 20% acrylonitrile. Effectively, the Examiner's claim interpretation disregards this claim limitation.

While the Examiner is correct that the claims could still include a further. polymer (e.g. "c.") of acrylonitrile rubber, the presently claimed "second polymer" b. cannot be fairly interpreted to be an acrylonitrile rubber. If the "b" polymer is not an

acrylonitrile rubber, Coran does not teach or suggest the present invention. Moreover, Coran lacks Appellants' substantially conjugated diene second polymer.

The Examiner further states that the reaction mixture of Coran would form a reaction product that anticipates the present invention. The Coran patent teaches a reaction product of four mixed components (i.e., nitrile rubber, amine-nitrile rubber, polypropylene, and MA-modified polypropylene), and it cannot be concluded to be a reaction product of only two of the four mixed components as alleged by the Examiner. It could not, therefore, anticipate the present reaction product of a first and second polymer. More particularly, the reaction product portion of the subject claims is limited to the resultant copolymer. Again, Appellants composition could include further polymers, e.g., as a later reaction product or blend of the claimed composition, but the claimed composition is a reaction product of polymers a and b,—not two additional constituents

Thus, Appellants submit that Coran does not anticipate or suggest any of the pending claims.

Issue 2

The Examiner states that the argument that Berta's comparative experiments show that the functionalized polymers do not react with the grafted polymers is interesting but not convincing. The Examiner further states this argument is contrary to the clear teachings of Berta in this regard. Appellants agree the argument is contrary to the stated teachings of Berta. The teachings of Berta, however, are not supported by the comparative examples of Berta. As demonstrated by the comparative examples of the Berta patent, adducts of a functionalized polymer with an anhydride-grafted polyolefin are actually detrimental to the properties of the composition. The

results of Berta's examples support Appellants' position that the anhydride-grafted polymer interacts with the oxidized wax. Conversely, Appellants provide clear evidence, by means of an extraction experiment, of an interaction between the functionalized polybutadiene and the maleic anhydride-grafted polypropylene, and of consequent improvements in the tensile properties of the composition.

Furthermore, the Examiner contends that a simple substitution of an amine functionalized butadiene (as in Stayer) for the Berta functionalized polymer (e.g. hydroxy-terminated butadiene) is all that is necessary to achieve the present invention. First, this ignores the fact that Berta is at least a four component system, up to a six component system. It cannot be concluded that Berta teaches a reaction product of only two of the 4-6 mixed components as alleged by the Examiner. It could not, therefore, render the present reaction product obvious. More particularly, the reaction product portion of the subject claims is limited to the resultant polymer.

Second, the Examiner's contention ignores the fact that hydroxy-terminated butadiene is only one of seven alternatives in the Berta teachings (column 1, line 65 – column 2, line 24). In this regard, the skilled artisan is faced with first choosing only two of the up to six components, then choosing one of seven alternatives for one of the two chosen components. After first facing this daunting task, the skilled artisan is then faced with considering all possible substituents capable of anhydride reactivity. These include, contrary to Examiner's contention, hydroxy, amine, and alkoxy substituents. This is not a simple substitution that would be obvious to the skilled artisan as contended by the Examiner.

Moreover, no motivation to specifically select the hydroxy-terminated polybutadiene as the functionalized polymer to modify exists. Furthermore, other than the hindsight of the present invention and the convenience of the Stayer reference, no

motivation exists to link the amine-terminated olefin/alkylene oxide copolymer with the polybutadiene as a teaching on amine functionality. Add to this level of unguided selection to reach the present invention, the fact that the functionalized polymer is only 2 to 8 parts per hundred of the thermoplastic olefin, it is clear the present reaction product is not prima facie obvious in view of Berta/Stayer as contended by the Examiner

Thus, Appellants maintain that the pending claims are inappropriately rejected as unpatentable over Berta in view of Stayer, Jr. and Admissions by Applicant.

## Conclusion

Appellants submit that claims 1-4, 6-10, 13-14, and 21 are not anticipated/obvious as concluded by the Examiner. Accordingly, Appellants respectfully request the Board to reverse the final rejection of all claims.

Respectfully Submitted,

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**CERTIFICATE OF MAILING**

I hereby certify that this **REPLY BRIEF** is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Assistant Commissioner for Patents, Washington, DC 20231 on April 2, 2001.

Georgeen B. George

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